DOCUMENT RESUME

ED 369 150 EA 025 749

TITLE	Integrating Technology in Secondary Schools.
INSTITUTION	National Association of Secondary School Principals, Reston, Va.
REPORT NO	ISSN-0547-4205
PUB DATE	Mar 94
NOTE	5p.
AVAILABLE FROM	National Association of Secondary School Principals, 1904 Association Drive, Reston, VA 22091-1537 ($2; quantity discounts).
PUB TYPE	Reports - Descriptive (141) -- Collected Works - Serials (022)
JOURNAL CIT	Curriculum Report; v23 n4 Mar 1994
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Educational Change; High Schools; *Integrated Activities; *Integrated Curriculum; Technological Advancement; *Technological Literacy; *Technology; *Technology Education

ABSTRACT

Using technology as part of learning paradigms is rapidly integrating into many schools' curriculums. To successfully integrate technology into a school's curriculum, the following groups must become actively involved in the integration process: (1) local school boards; (2) administrators; and (3) teachers. Two schools in San Antonio, Texas are integrating technology into their curriculums by using two different formats. Tom C. Clark High School is a Professional Development School site within the San Antonio Center for Educational Development and Excellence (CEDE). Clark High School's technology integration program is based on two principles: cross training and site-based decision making. To better integrate technology into their school, Clark High brought many different subject teachers together to design a multimedia presentation. Sam Houston High School as a partner in a Cooperative Research and Development Agreement is designing and testing a series of fundamental skills tutorials. The cooperative project is an effort to develop, research, and transfer intelligent tutoring systems technology to public schools and industry under federal transfer guidelines. The overall aims of the project are to generate educational materials to achieve current educational goals on the national level and support the real-life implementation of technology in the classroom. (KDP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 369 150

CURRICULUM REPORT
nassp
Vol. 23 No. 4 March 1994 (ISSN 0547-4205)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Integrating Technology In Secondary Schools

"PERMISSION TO REPRODUCE THIS MATERIAL IN **OTHER THAN PAPER COPY** HAS BEEN GRANTED BY
T. F. Koerner
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"

To prepare students to live and work in the computer/information age of the 21st century, students must become technologically aware through the introduction and use of a variety of application and training modes.

During the past decade, many school districts across the United States, recognizing this responsibility, have begun providing both the technological hardware and the necessary instructional and application training to implement this premise.

In a 1993 survey conducted by *Electronic Learning*, 64 percent of all U.S. school districts indicated they had a formal, written technology plan that incorporated these notions during at least three years. This is a far cry from a similar survey administered by the National School Boards Association in 1985 that reported that 85 percent of their district members were not even planning to acquire computers or other forms of technology during the forthcoming year.

At the same time that the acquisition of educational technology and concurrent instruction in its use has increased and become more systematic, using technology as part of learning paradigms has also spread into a large segment of the curriculum. While computer education and mathematics still lead the way with 83 percent and 82 percent, respectively, of ongoing technology usage, more than 55 percent of art, business, language arts, science, and social studies educators report that they also use computers and other forms of micro technology as part of their instructional efforts (*Electronic Learning*, 1993).

Successfully integrating technology into the school involves several groups. First and foremost, the local school board and its central administration must be committed financially and willing to accommodate the structural and philosophic changes technology may bring, whether it be offering new types of classes in the ethics of the information age or setting up teams of teachers from various content areas who want to use technology as part of the learning process in a cross disciplinary approach.

Second, administrators must actively develop campus technology plans and ensure they are implemented. This may require increased personal training in technology as well as hands-on involvement in determining the type of technology that will be used in the school and assessing its success or failure.

The third and most important group that must be considered when infusing technology into schools is the teachers. They will be charged with incorporating the technology into their instruction, ensuring their students understand how to use and apply the hardware and software that will be part of their educational experiences,

EA 025 749

and possibly be retrained in both curricular and pedagogical concepts.

Below are examples of programs that are integrating technology in two different formats. In addition to including the three aforementioned groups in implementation, they also use a community partner to help them in training and implementation. This component, while not necessary, increases and accentuates the community's role in building technological infrastructures that reach from the classroom to the workplace.

Integrating Technology In San Antonio Schools

Public education in the Greater San Antonio area is provided by 15 independent school districts. Each of these districts operates independently with its own board of trustees. These districts vary in size from 894 to almost 60,000 students.

Each of these districts and the schools within them must by state law have an approved educational technology plan. These plans are as diverse as the school districts within the San Antonio metropolitan area. All include similar elements of hardware acquisition, teacher training, and integrating the technology within existing curriculum and essential element structures. The two projects discussed here are part of each of the two districts' technology plans.

TOM C. CLARK HIGH SCHOOL --
PROFESSIONAL DEVELOPMENT SCHOOL
5150 DeZavala Road
San Antonio, Tex. 78220
Contact: Phyllis Giffin, principal (210) 561-5150

Tom C. Clark High School, with a student population of approximately 2,300, is one of seven high schools in the Northside Independent School District. As part of its efforts to expand the use of technology on its campus, Clark applied for and was accepted as a Professional Development School site within the San Antonio Center for Educational Development and Excellence (CEDE).

CEDE is a San Antonio community collaborative consisting of all public and private institutions of higher education within San Antonio, six independent school districts, and the Regional Education Service Center. Its goal is to be a collaborative community and a center of inquiry dedicated to the continuous development of teachers as learners in a culturally diverse, technologically enriched educational environment.

The Professional Development Schools (PDS) are to eventually provide both the technology hardware and professional and technical education to its preservice and inservice teachers. Part of this process involves training teachers in how to best use technology in their instructional frameworks.

The focus of this Professional Development Core rests on cross training and site-based decision making. Cross training implies that both professional and technical education may be directed by a variety of members of the collaborative community. For example, information on how to design a CD-ROM-based lesson might be presented by a classroom teacher, university professor, or member of the community to a class of college and high school students, classroom teachers, and university instructors. This design allows for a collegial instructional model rather than one based on hierarchy. It breaks away from the notion that information and learning flow is directed downward. It calls for a shared responsibility in the education process as well as an active ongoing evaluation of knowledge acquisition.

The second principle, site-based decision making, allows staff members at each PDS site to determine the technological/professional emphasis it would like to pursue. This process not only calls for each PDS to choose an academic perspective, but it also enables each PDS to focus on long-term implications of change and restructuring in particular curricular fields through an active collaborative research program. One site may choose to emphasize English instructional development while another might use social studies to integrate technology with instruction.

All the teachers involved in this program have been trained in various aspects of multimedia programming and instructional design as part of their learning process.

The Clark High School professional staff decided to bring biology, computer science, English, foreign language, mathematics, social studies, and theater arts teachers together to design a multimedia presentation that will be used in all the aforementioned classes as part of a cross disciplinary program in ecology.

By using cross-training and site-based decision-making principles throughout the CEDE collaborative, continuing technological integration is influenced by a wide selection of campus-based professional development programs. The knowledge and products gleaned by the teachers at Clark will be shared by their colleagues throughout the collaborative. Teachers will thus be exposed to continual professional development activities that reach beyond their campus and district bound-

aries. This kind of educational model offers an opportunity to learn in a restructured, cooperative learning mode.

To promote and organize professional and technological activities at each PDS site, a lead teacher has been designated to act as a Professional Development Coordinator. This individual acts as a PDS site leader for training and other professional development projects and may be called on to assist in the development of technology implementation plans for that school site.

In addition to PDS site coordinators, several Clark professional staff members are mentor teachers. These instructors are outstanding teachers who manage multiple instructional arrangements, help students with different learning styles, develop classroom and community experiences designed to promote learning goals for students, and understand the role of technology in their content fields. These teachers work with university instructors in planning and delivering instruction in technological applications to all members of the PDS community.

The first training sessions in technology applications for teachers began in the spring of 1993 with installation of various types of technology including a satellite downlink system and compressed video unit in the following months. The production of the multimedia classroom presentation began in fall 1993, with the first university/school-taught preservice teacher methods class scheduled for this spring.

SAM HOUSTON HIGH SCHOOL -- NASA TECHNOLOGY DEMONSTRATION SITE

4635 E. Houston Street
San Antonio, Tex. 78220
Contact: Betty Williams, principal (210) 661-4134

Sam Houston High School, with an enrollment of approximately 1,300, is the smallest of the eight high schools within the San Antonio Independent School District. For the past two years it has been part of a unique partnership between the federal government, an institution of higher education, and school districts from five states that are involved with designing and testing a series of fundamental skills tutorials.

Originally begun as Cooperative Research and Development Agreement between the U.S. Air Force Armstrong Laboratory at Brooks Air Force Base and the University of Texas at San Antonio in 1991, and adding the National Aeronautics and Space Administration (NASA) and the San Antonio Independent School District as funding partners during the past two years, this project is envisioned as an effort to develop, research, and transfer intelligent tutoring systems technology to public schools and industry under federal transfer guidelines, and to apply cognitive science in a way that enhances the power of computer-based instruction systems by acting as an expert private tutor.

The overall aims of the project are to generate educational materials to achieve current educational goals on the national level and support the real-life implementation of technology in the classroom. Its goals are to:

1. Support public education through the recognition of the need to enhance learning through the use of technology
2. Evaluate technology in applied settings
3. Transfer the technology developed in this project to public schools and industry.

Included in this project are a cross section of mathematics, English, and science teachers and a cross section of students. Many of these teachers, prior to their involvement with this program, had not received any training in hardware or software applications and are not versed in research methodology.

The three tutorials that are being developed through these efforts are:

- Word Problem Solving (WPS) for mathematics
- Reading/Writing (R-WISE) for English
- Life and Environmental Science for biology

The implementation of this project at Sam Houston began with the construction of the first of two computer laboratories. Two drafting rooms were gutted and two 25-unit, networked, computer workstations were installed in them. In addition to the computers, laser printers and LCD display panels were purchased for teacher use. Later, the word problem solving and reading and writing software were installed.

Teachers who had volunteered to become part of this experiment were then trained during the summer to use the tutorials and the computer laboratory, and given examples of how they might integrate the lessons provided by the tutor with the "regular" curriculum content they were charged with teaching.

As with the other sites in this project, a school site project coordinator and technical adviser were then hired. The project coordinator is a teacher whose responsibilities include scheduling classes in the laboratory, overseeing curriculum implementation, and acting as liaison between the school and the other project entities. The technical adviser maintains the equipment and assists in ongoing teacher training technological activities.

During the 1992–93 school year, the WPS software was used in all the pre-algebra classes at Sam Houston High School. Its use will be expanded to include all the algebra classes in the 1993–94 school year.

The R-WISE tutorial was installed for 1993–94. As part of the experimental nature of this program, it will be used by half the freshman English students at Sam

Houston. The remainder of the students will be using the laboratory as part of their English class requirements in learning word processing skills.

Encouraging Teacher Involvement With Technology

Although computers and other forms of interactive technology have been available for classroom use for nearly a decade, many teachers are still reluctant to either use the technology themselves or to change their learning environments to encompass these new forms of information acquisition. Their reasons range from a lack of knowledge about technology to simply refusing to change teaching patterns. The challenge for any principal is to get teachers to change these outlooks and become involved in projects such as those described above.

In meeting this call for increasing diversity of learning patterns, the principal must become a technological instructional leader. Not only must the school leader encourage the use of technology by purchasing equipment and providing training in its use, but he or she must also become a role model in the awareness, acceptance, and application of educational technology through its use in school-related tasks such as record keeping and electronic mail.

Beyond this, the principal, through local school involvement councils, should also meet the questions of technological intervention head on. For example, many teachers may need extra time beyond the training that the school provides to understand how to apply technology to their subject area. Computers and other forms of technology might be checked out for teacher use at home or software in the teacher's content area might be purchased.

Finally, teachers and parents must work together to understand the introduction and use of technology in schools. Both teachers and parents would benefit, for example, from technology fairs where hardware, software, and workplace applications are presented.

Some Final Words

If we are to truly allow the impact of technology to take effect we need to build incrementally, adding training and delivery systems as needed. This process relies on understanding that what may be technologically appropriate for one student population, has no relevance to another.

It also calls for constant teacher input into the types of training and hardware and software needed to make technology work as well as student evaluation of what is being presented to them in terms of their educational and vocational needs.

Reference

Electronic Learning, October 1993, pp. 23–24.13.

KUDOS

Richard Diem is a professor of education at the University of Texas at San Antonio (UTSA). Currently he is working with the UTSA CEDE Project as a co-director and is the principal investigator for the UTSA/NASA Fundamental Skills Project.

Ed. Note. The January 1994 *Curriculum Report* was written by Francis P. Hunkins, a professor of education at the University of Washington, Seattle.

Copyright 1994 by NASSP. *Curriculum Report* is a bi-monthly publication of the National Association of Secondary School Principals, 1904 Association Dr., Reston, Va. 22091-1537. Annual subscription rate of $4 included in the dues of NASSP. Individual subscriptions not available. Individual copies, $2; 2–10 copies, $1.75 each; 11–99 copies, $1.25 each; 100 or more, $1.15 each. *Payment must accompany orders of $15 or less.*

ESTHER J. COX, *President, NASSP*

TIMOTHY J. DYER, *Executive Director*

ROBERT MAHAFFEY, *Director of Publications and Marketing*

CAROL A. BRUCE, *Associate Director of Publications*

PATRICIA LUCAS GEORGE, *Editor*

RAYMOND CALABRESE, *Contributing Editor*